

REMARKS

Applicants have amended their claims in order to further clarify the definition of various aspects of the present invention. Specifically, claim 1 has been amended to incorporate therein the subject matter of claims 5-8; to further define amounts of the various components; and to recite that the amount of each of the components is on the basis of 100 parts by weight of the whole resin composition. Claim 1 has been further amended to delete recitation of "EPR", "EPR-g-MA", "all-acrylic-core-shell rubber", "EVOH", and "various thermal plastic elastomers and plastomers, or mixtures thereof". Claim 1 has been still further amended to recite methacrylate-butadiene-styrene, rather than "arylmethacrylate-butadiene-styrene". In light of these amendments to claim 1, claims 5-8 have been cancelled without prejudice or disclaimer; in addition, claims 10 and 11 have been cancelled without prejudice or disclaimer.

Claim 2 has been amended to delete "or combinations thereof"; and claim 3 has been amended to clarify that the polyamide is a homopolymer or a polyamide copolymer, various "copolymers" being set forth. Claim 9 has been amended to be dependent on claim 1, and to recite that the final shell of the core-shell rubber contains specified amounts, on the basis of the whole weights of the core-shell rubber, of a monomer having a reactive functional group, this monomer being further defined. Claim 12 has been amended to delete "a hose".

In addition, Applicants are adding new claims 13-18 to the application. Claims 13 and 14, each dependent on claim 1, respectively recites that the core-shell rubber has a core of the hard polymer and a shell of the soft polymer; and recites that

the soft polymer is of a material selected from the group consisting of butadiene, isoprene, alkylacrylate, alkylmethacrylate and siloxane. Note, for example, the paragraph bridging pages 8 and 9 of Applicants' specification. Claims 15-18 recite the same subject matter as set forth in claim 12, but are dependent respectively on claims 2-4 and 9.

Applicants respectfully traverse the rejection of their claims under the second paragraph of 35 USC §112, as set forth in Item 1 on pages 2 and 3 of the Office Action mailed July 2, 2003, particularly insofar as this rejection is applicable to the claims as presently amended. Thus, claims 1-3, 9 and 12 have been amended in light of each of the reasons given by the Examiner for the indefiniteness rejection on pages 2 and 3 of the Office Action mailed July 2, 2003. For example, claim 1 now recites that the recited amounts are based upon 100 parts by weight of the whole resin composition; moreover, recitation of EPR and EPR-g-MA are deleted, so as to avoid any issue of redundancy between these recitations and the recitations "EPM" and "EPM-g-MA". Furthermore, "arylmethacrylate" has been deleted and "methacrylate" substituted therefor, avoiding any question as to what is meant by "arylmethacrylate". The language of claim 1 has been amended to make clear the various Markush groups. Moreover, claim 1 has been amended to recite "plasticizer" and "thickener", clarifying the component being recited. Components (B) and (E) have been amended to make clear the difference therebetween; and in view of amendments to component (E), and deletion of the recitation "all-acrylic-core-shell rubber" from component (B), it is respectfully submitted that differences between components (B) and (E) are clear.

Similarly, in light of amendments to recitations in component (B) and (D), particularly recitation of specific materials in (D), it is respectfully submitted that claim 1 is clear with respect to components (B) and (D).

In view of amendments to claim 2 to delete the recitation "or combinations thereof", any question concerning an improper Markush group format in claim 2 is moot; and in claim 3, a typographical error with respect to the word "copolymer" has been corrected. It is respectfully submitted that claim 3, as presently amended, is clear in reciting, inter alia, a "polyamide copolymer", and it is respectfully submitted that in view of present amendments to claim 9 to recite a monomer having a reactive functional group, this monomer being further defined as being selected from a specific group, any question as to what is meant by "reaction monomer" in previously considered claim 9 is moot. Claim 12 has been amended to recite a fuel tube for motor vehicles; in view of present amendments to claim 12, it is respectfully submitted that claim 12 is clear as to the component being claimed therein. In view of canceling of claim 6, it is respectfully submitted that any question as to what is meant by "polyfunctional" is moot.

The question by the Examiner in connection with each of claims 1 and 3, as to whether copolymers (as opposed to unreacted monomers) are intended to be claimed, is noted. It is respectfully submitted that claims 1 and 3 clearly set forth the metes and bounds of the present invention, with respect to the materials being claimed, such that one of ordinary skill in the art would know whether any specific composition, including the impact resistant component and polyamide resin, fell within or outside the scope of

the present claims. In this regard, note that claim 3 specifically recites a polyamide copolymer blended or copolymerized with at least one of a specified group. Thus, it is respectfully submitted that claims 1 and 3 satisfy this requirement of the second paragraph of 35 USC §112. See In re Moore, 169 USPQ 236 (CCPA 1971).

Applicants respectfully submit that all of the claims presented for consideration by the Examiner patentably distinguish over the teachings of the references applied by the Examiner in rejecting claims in the Office Action mailed July 2, 2003, that is, the teachings of the U.S. patents to Lausberg, et al., No. 5,179,164, and to Chundury, et al., No. 5,317,059, under the provisions of 35 USC §103.

It is respectfully submitted that these references as applied by the Examiner would have neither taught nor would have suggested such a polyamide resin composition as in the present claims, having the recited components (A) through (E), and particularly wherein such composition includes 0.5-5 parts by weight of core-shell rubber including at least a hard polymer having a glass transition temperature of at least 25°C and at least a soft polymer having a glass transition temperature of at most 0°C, with a weight ratio of 1:9 to 9:1. See claim 1.

In addition, it is respectfully submitted that these references would have neither disclosed nor would have suggested such composition as in the present claims, including the core-shell rubber, and wherein the rubber has a core of the hard polymer and a shell of the soft polymer (see claim 13), or wherein the soft polymer of the core-shell rubber is of a material selected from the group consisting of butadiene, isoprene, alkylacrylate, alkylmethacrylate and siloxane (see claim 14); and/or wherein the vinyl

shell of the core-shell rubber includes specific amounts of a monomer having a reactive functional group, this monomer being further defined (see claim 9).

Furthermore, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested the other aspects of the present invention as in the remaining, dependent claims, including (but not limited to) wherein the polyamide is a nylon selected from the specific group set forth in claim 2; and/or wherein the polyamide is a homopolymer or polyamide copolymer as set forth in claim 3; and/or wherein the polyamide is semi-crystalline or of amorphous structure, as in claim 4; and/or wherein the final shell of the core-shell rubber contains specific amounts of a monomer having a reactive functional group, the monomer being further defined, as set forth in claim 9; or a fuel tube for motor vehicles as set forth in claims 12 and 15-18.

The present invention is directed to a polyamide resin composition having excellent gasoline resistance and impact resistance under cold environments, applicable to a fuel tube system for a motor vehicle.

Various polyamides are known, which are excellent in mechanical strength, abrasion resistance, heat resistance, chemical resistance, electrical insulation and arc resistance, and are materials of interest for various applications. However, they have limitations for use in, e.g., tubes for motor vehicles.

To overcome drawbacks of previous polyamide resins, there have been provided polyamide resins reinforced with a nylon elastomer or a polyamide resin prepared by adding ethylene propylene rubber and other components thereto.

However, the compositions with added components also have problems, particularly when employed as tube materials of a motor fuel system. In particular, note the last three paragraphs on page 2 of Applicants' specification.

Against this background, Applicants provide a resin composition having good flexibility, workability, impact resistance even under cold environment, and external appearance, and which can satisfactorily be used in tubes for motor fuel tube systems. In particular, Applicants have found that by incorporating the core-shell rubber as recited in the present claims, external appearance of molded products, elongation under tension and impact resistance under cold environment are improved. See the paragraph bridging pages 8 and 9 of Applicants' specification.

In particular, attention is respectfully directed to Examples 3-6 and 10, as set forth in Table 1 on pages 12 and 13 of Applicants' specification, as compared with the other examples and the Comparative Example. As can be seen in the results therefrom, resin compositions according to the present invention, having the core-shell rubber as claimed, have improved properties in terms of external appearance and impact strength, as compared with other compositions. It is respectfully submitted that this evidence in Applicants' specification must be considered in determining patentability of the presently claimed subject matter. See In re DeBlauwe, 222 USPQ 191 (CAFC 1984). Properly construing this evidence in Applicants' specification, it is respectfully submitted that this evidence shows unexpectedly better results achieved according to the present invention, having the specified core-shell rubber, and further supports patentability of the presently claimed subject matter.

Lausberg, et al. discloses polypropylene/polyamide molding compositions which contain as an adhesion promoter an ethylene copolymer polymerized from (a) ethylene; (b) at least one alkyl(meth)acrylates but not tert-butyl (meth)acrylate; and (c) at least one further monomer having a group which is reactive toward the polyamide under the conditions of preparation. See column 1, lines 8-17. Note also column 2, line 31 to column 3, line 3. This patent discloses that one of the components of the polypropylene/polyamide molding composition includes an impact modifier, to improve impact strength, such impact modifier advantageously being an impact-modifying elastomer. See column 5, lines 31-35. This patent discloses that the elastomers may also include graft polymers formed from a specific component (see column 6, lines 23-34); and that graft substrates which are also suitable are acrylate rubbers having a diene core. See column 6, lines 23-34 and 63-65.

It is respectfully submitted that Lausberg, et al. does not disclose, nor would have suggested, such resin composition as in the present claims, having the recited components including, inter alia, the core-shell rubber comprising at least a hard polymer having a glass transition temperature of at least 25°C and at least a soft polymer having a glass transition temperature of at most 0°C, with a weight ratio of 1:9 to 9:1, or the other aspects of the present invention as discussed previously.

The contention by the Examiner on page 4 of the Office Action mailed July 2, 2003, that Lausberg, et al. in Table 3 sets forth various compositions "which meet the requirements of the present claims with respect to components A, B, D and E and their contents" is respectfully traversed. It is respectfully submitted that while this

Table 3 in Lausberg, et al. includes rubbers of the type D1 and D2, D1 and D2 being described from column 9, line 54 to column 10, line 13, such disclosure does not teach, nor would have suggested, the core-shell rubber including at least the specified hard polymer and soft polymer as in the present claims, with the recited weight ratio, particularly where such core-shell rubber is a component in addition to the at least one impact resistant component; and advantages achieved by the present invention due to inclusion of such core-shell rubber as discussed previously and as set forth in the original specification of the above-identified application, including experimental data therein.

In addition, it is respectfully submitted that Lausberg, et al. would have neither disclosed nor would have suggested additional features of the present invention as in the dependent claims, having the features as set forth in present claim 1. In this regard, it is respectfully submitted that Lausberg, et al. does not disclose, nor would have suggested, a fuel tube for motor vehicles formed from the recited polyamide resin composition, as in claims 12 and 15-18.

It is respectfully submitted that the additional teachings of Chundury, et al. would not have rectified the deficiencies of Lausberg, et al., such that the presently claimed invention as a whole would have been obvious to one of ordinary skill in the art.

Chundury, et al. discloses polymer blends which are polymeric compositions including a mixture of an olefin polymer, a polyamide, and at least one compatibilizer which is a terpolymer. The blended polymer composition is described most generally at column 3, lines 5-33, with the at least one terpolymer being described therein at

column 3, lines 11-15. This patent also discloses that the blended polymer compositions can be processed into shaped articles by extrusion, coextrusion, thermoforming, blow-molding, injection-molding, compression-molding, calendaring, laminating, stamping, pultrusion, etc. (see column 13, lines 62-66); and that the blended polymer compositions are useful for automotive, electrical, electronics, building, furniture, small appliances and other applications (see column 17, lines 24-27).

Even assuming, arguendo, that the teachings of Chundury, et al. were properly combinable with the teachings of Lausberg, et al., such combined teachings would have neither disclosed nor would have suggested the presently claimed composition and component (fuel tube for motor vehicles) prepared therefrom. It is respectfully submitted that the teachings of Chundury, et al. and of Lausberg, et al. would have neither taught nor would have suggested the resin composition, including, inter alia, the core-shell rubber as in the present claims, or other aspects of the present invention in the present claims.

The contention by the Examiner that it would have been obvious to have prepared a tube or a hose from the composition of Lausberg, et al., in view of the teachings of Chundury, et al., is respectfully traversed. Chundury, et al. provides no disclosure of forming a fuel tube, much less a fuel tube for motor vehicles, as in claim 12. Accordingly, the basis for the conclusion of obviousness of the fuel tube of claim 12 is not seen.

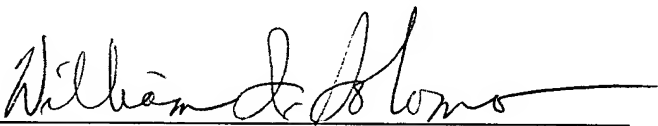
As is clear from Applicants' discussion concerning prior techniques, various problems arise in connection with providing a material having high gasoline resistance, which can be used for a fuel tube for motor vehicles. Particularly in light thereof, it is respectfully submitted that the general disclosures in Chundury, et al. in connection with processing by, inter alia, blow-molding, and in connection with utility for, inter alia, automotive applications, would have neither taught nor would have suggested the fuel tube for motor vehicles as in various of the present claims.

In view of the foregoing comments and claim amendments, reconsideration and allowance of all claims remaining in the application are respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR § 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to the Deposit Account No. 01-2135 (Case No. 1143.41013X00), and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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